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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/614,855	07/07/2003	Xiao-An Zhang	200300074	9152

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FORT COLLINS, CO 80527-2400

EXAMINER

RUDE, TIMOTHY L

ART UNIT	PAPER NUMBER
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2883

DATE MAILED: 03/24/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/614,855

Applicant(s)

ZHANG ET AL.

Examiner

Timothy L. Rude

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 January 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) 2,4,9,14-16,18,20,25 and 30-32 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3,5-8,10-13,17,19,21-24 and 26-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 20030707, 20060103.

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Claims 14-16 and 30-32 stand withdrawn due to a prior restriction.

Applicant's election without traverse of species E, G, and I in the reply filed on 29 July 2005 is acknowledged.

Claims 2, 4, 9, 17-18, 20, and 25 are presently withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 29 July 2005.

Claim Objections

Claims 3, 5, 8, 10, 19, 21, 24, and 26 are objected to because of the following informalities: They depend from withdrawn claims. For examination purposes, they will be considered to depend from their base claims. Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 3, 5-8, 10-13, 17, 19, 21-24, and 26-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Devonald et al (Devonald) USPAT 5,275,924.

As to claims 1 and 17, Devonald discloses a method of making a three-dimensional [col. 10, lines 15-25 and 50-65] molecular assembly, formed on a substrate, said molecular assembly comprising:

a first monolayer of seed molecules for initiating self-assembled molecular growth, said first monolayer formed on said substrate [end of molecule, col. 1, line 54];

a second monolayer of active molecules comprising a plurality of rotor moieties and stator moieties, with one rotor moiety supported between two stator moieties, said second monolayer of active molecules formed on said first monolayer of seed molecules, with a one-to-one correspondence between molecules in said first

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monolayer and said second monolayer [X as selected from molecules at col. 1, line 60 through col. 2, line 9];

a third monolayer of spacer molecules, formed on said second monolayer of active molecules, with a one-to-one correspondence between molecules in said second monolayer and said third monolayer [other end of molecule, col. 1, line 54]; and

a plurality of alternating second monolayers and third monolayers having said one-to-one correspondence [stacking, col. 10, lines 15-25 and 50-65].

Devonald does not explicitly claim his first stator molecule [connected to substrate] is a "seed" molecule.

Devonald teaches that use of the Langmuir-Blodgett technique is superior to electric field pointing in that it produces NLO active species that are aligned in parallel. Examiner considers such a technique to read on Applicant's "seed" molecule method, especially in view of Devonald's teaching of stacking layers of like or alternate nature [stacking, col. 10, lines 15-25 and 50-65].

Devonald is evidence that workers of ordinary skill in the art would find the reason, suggestion, or motivation to use seed molecules to form ordered layers by the preferred Langmuir-Blodgett technique to produces NLO active species that are aligned in parallel.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the invention of Devonald with the seed molecule technique to produces NLO active species that are aligned in parallel.

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As to claims 3, 10, 19, and 26, Devonald teaches, as combined above, the three-dimensional molecular assembly wherein said seed molecules comprise two asymmetric connector portions, on opposite sides of said interconnecting portion [end of molecule, col. 1, line 54].

As to claims 5 and 21, Devonald teaches, as combined above, the three-dimensional molecular assembly wherein said active molecules comprise two connector portions connected to said at least one stator moiety, on opposite sides thereof to form a first connector portion and a second connector portion [X as selected from molecules at col. 1, line 60 through col. 2, line 9].

As to claims 6, 11, 22, and 27, Devonald teaches, as combined above, the three-dimensional molecular assembly wherein each said connector portion has at least one functional group thereon, which is the same for said first connector portions and said second connector portions [col. 2, lines 1-25].

As to claims 7, 12, 23, and 28, Devonald teaches, as combined above, the three-dimensional molecular assembly wherein said first connector portions each have at least one first functional group thereon, which is the same for all first connector portions and wherein said second connector portions each have at least one second functional group thereon, which is the same for all second connector portions, wherein said at

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least one first functional group is different than said at least one second functional group [optional, col. 2, lines 1-25].

As to claims 8 and 24, Devonald teaches, as combined above, the three-dimensional molecular assembly above.

Devonald does not explicitly disclose an assembly wherein not all stator moieties have any said connector portions connected thereto.

Devonald teaches that one may functionalize at less than 100%, but preferably more than 50% [col. 5, lines 5-15] as needed to obtain desired optical properties.

Devonald is evidence that workers of ordinary skill in the art would find the reason, suggestion, or motivation to use stators wherein not all stator moieties have any said connector portions connected thereto as needed to obtain desired optical properties.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the invention of Devonald with stators wherein not all stator moieties have any said connector portions connected thereto as needed to obtain desired optical properties.

As to claims 13 and 29, Devonald teaches, as combined above, the three-dimensional molecular assembly of Claim 1.

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Devonald does not explicitly teach an assembly wherein said substrate comprises a first electrode and wherein said molecular assembly further comprises a second electrode formed on an uppermost monolayer.

Devonald teaches that his films are applicable to electro-optic optical switching devices [col. 9, lines 52-57] with improved optical properties.

Devonald is evidence that workers of ordinary skill in the art would find the reason, suggestion, or motivation to add electrodes across the assembly of layers [Applicant's substrate comprises a first electrode and wherein said molecular assembly further comprises a second electrode formed on an uppermost monolayer] to comprise an electro-optic optical switching device with improved optical properties.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the invention of Devonald with a substrate comprising a first electrode and wherein said molecular assembly further comprises a second electrode formed on an uppermost monolayer to comprise an electro-optic optical switching device with improved optical properties.

Any references cited but not applied are relevant to the instant Application.

Zhang et al USPAT 6,751,365 B2 and Vincent et al USPAT 6,809,956 B2, both provided by Applicant are relevant to the instant Application.

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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy L. Rude whose telephone number is (571) 272-2301. The examiner can normally be reached on Mon-Thurs.

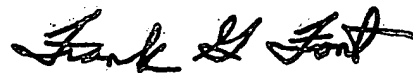
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on (571) 272-2415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



tlr

Timothy L Rude
Examiner
Art Unit 2883



Frank G. Font
Supervisory Patent Examiner
Technology Center 2800